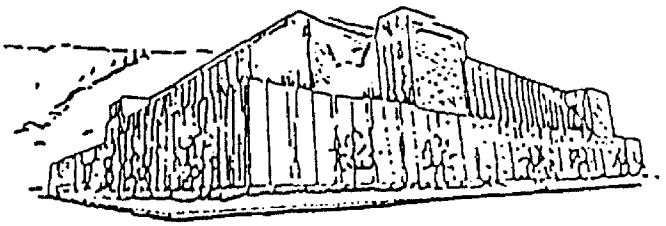
2003

Discussion of training strategies of a specialized tactical team

Michelle Wilson
The University of Montana



Maureen and Mike
MANSFIELD LIBRARY

The University of **MONTANA**

DISCUSSION OF TRAINING STRATEGIES OF A SPECIALIZED TACTICAL TEAM

by

Michelle Wilson

B.S. The University of Montana, 1995

presented in partial fulfillment of the requirements

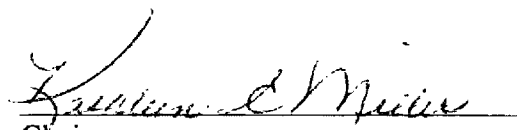
for the degree of

Master of Science

The University of Montana

1997

Approved by:



Chairperson

Dean, Graduate School

10-27-97

Date

Wilson, Michelle M., M.S., December 1997 Health and Human Performance

Discussion of Training Strategies of a Specialized Tactical Team

Director: Dr. Kathleen E. Miller, Ph.D.

Training for the members of tactical teams, physical and otherwise, is specific to the nature of the call-outs in which the officers are involved. The Missoula, Montana Sheriff's department is unique in the type and frequency of their call-outs. The geographic location of Missoula, including the inclement weather changes, and the population the team serves, in addition to numerous other factors make the Missoula area unlike many others.

Regardless of the size of the city or county population most police and sheriff's departments have some type of tactical team organized to deal with emergency type situations. Tactical teams are typically called in to handle high risk situations that the regular duty officer is not trained or equipped to handle. The Missoula, Montana Sheriff's department has an established tactical team, known as the Special Response Team (SRT). The SRT is comprised of eight men who voluntarily participate in the group above and beyond their duties as officers in various capacities. The Missoula SRT is called on for a variety of emergency type situations where the skills they have developed through training are used to handle various situations.

A look at the training programs and the type of call-outs of a variety of tactical teams is reviewed for ideas on further enhancing the training, specifically physical, of the Missoula team. The goal being to incorporate more job specific tasks in the groups physical training regimen to allow the officers to more safely and successfully do the variety of tasks they are called on to perform.

In addition to looking at other departments' teams, the members of the Missoula team provided the physical abilities they believe are important for performing their job optimally. Determining what physical components are necessary, from the team's standpoint, will provide further rationale for more job specific training.

TABLE OF CONTENTS

Discussion of Training Strategies of a Specialized Tactical Team

The Special Response Team (SRT) of the Missoula Sheriff's department is formed of eight deputies, including a team leader. The team is currently comprised of all male members who are full-time deputies that come together on a volunteer basis to form the SRT. The group is called upon in high risk situations such as hostage rescue, barricade isolation and containment, high risk warrant service, and management of jail problems and riot situations. They work in conjunction with other law enforcement agencies, medical staff, and/or special interest groups in a variety of settings and conditions.

SRT members participate in physical fitness testing on a quarterly basis. Testing includes a mile and a half run, push-ups, sit-ups, and a sit and reach test which measure aerobic endurance, muscular strength, muscular endurance, and flexibility, respectively. Members of the SRT are required to qualify in the 60th percentile, compared to other deputies who have to qualify in the 40th percentile. The qualifying percentages the sheriffs are expected to meet are accepted by the state of Montana and are academy accepted. The chart (table 1) demonstrates the minimal performance requirements for males and females of the SRT. As demonstrated, the minimal requirements decrease with age. In addition to quarterly physical fitness testing, SRT members meet monthly for training in areas such as interior tactics, confrontation management, and chemical agents containment.

The reputation of law officers as coffee-drinking, donut-eating, physically inactive, patrol-car-officers is somewhat disconcerting knowing that we are relying on these people for our protection. Although the bulk of their job is relatively sedentary, they do have an additional component that requires them to be physically active within a moment's notice.

This population is at an even greater disadvantage because deputies tend to have long and irregular shifts, a high degree of job-related stress, and poor nutritional habits. Deputies, and SRT members, even more so, are required to perform despite their less than optimal working conditions. Because the SRT is called out in emergencies at any given time, they may be even more compromised in their sleep, stress, and nutritional status. Police academies are developed to prepare candidates physically, among other components, for their role in law enforcement. Prior training is very important to prepare candidates for a career in law enforcement, however, this begins the controversy of whether physical fitness testing should be mandated after employment. Proponents believe routine physical ability testing helps maintain a higher level of overall fitness by expecting the men/women to meet minima standards on a regular basis. In this way fitness is more likely to be upheld throughout the year(s). The flip side of the argument suggests that once fitness standards are met, initially upon employment, it is within the scope of an officer's job to maintain fitness independently, without the need to be checked, via physical ability testing (Hoffman & Collingwood, 1995). Typically, individual forces adopt training programs and mandate minimal physical fitness standards for their deputies. Another issue is the physical fitness tests that are being used. For instance, the Missoula Sheriff's department uses a mile and a half run , sit-ups, push-ups, and a sit and reach test to determine fitness. Regardless of the validity of these tests for general population, they are probably not very indicative of what deputies are doing in the field. Training should be job specific and regular physical fitness testing should encompass job specific tasks (Hoffman & Collingwood, 1995).

Between quarterly physical fitness testing the men of the SRT are left to their own devices to maintain their fitness levels. The monthly meetings in which they engage as a

group are most often tactical in nature versus physical, which gives them little time to train physically as a group. The concern, from a public standpoint, is that our public servants are not highly physically fit (Hoffman & Collingwood, 1995). We would expect the SRT group, to an even greater degree, to be among the elite, physically, but on the whole this is not the case. In national studies comparing police officers to the general population, deputies were in worse shape than the average person (Hoffman & Collingwood, 1995). The obvious way to address this problem is by offering deputies incentives to maintain their fitness levels through the years and ranks. Most forces, however, do not have funds to, 1) offer incentives, or 2 provide qualified staff to aid the deputies in achieving and maintaining optimal fitness levels. Optimal being the key word here because different tactical groups will face unique challenges based on personnel, geographic location, available equipment, and the number and type of call-outs to which they respond. Additionally, funding and salaries become an issue. For example, although the SRT members form an elite group, they are not compensated at a higher rate given their additional training and involvement in the team. Optimal fitness for one group may not be the same as for another group in a different area. One way to approach fitness among the SRT is by providing them with a physical fitness program that is specific to their jobs and which they can accomplish on their own time.

The goal of implementation of job specific training is to better and more effectively prepare officers for duty. There is a great importance for the SRT members to be physically prepared because they are called to perform in very diverse situations. The duties of the SRT are unique because they have to be competent in many different areas and prepared for anything. When on a call-out the officers wear flack jackets weighing 40-50 pounds and may also have to carry a body bunker weighing 70 pounds, a door ram weighing 50 pounds, as

well as any other equipment that may be necessary. Due to the emergent nature of their jobs, the officers may be working long shifts with little or no sleep and possibly with a diminished nutritional or hydration status or both. To be practical, I would like to develop a program that the officers will maintain. A regimen that is beyond the scope of their duties will not lure them toward increasing their fitness level, let alone maintaining it.

As previously mentioned there is no monetary incentive for these officers to participate, but I expect that as a team they will want to better prepare themselves for duty. They already show the initiative by volunteering on the SRT and attending monthly training meetings. Taking their training a step further to more job specific physical training would be a logical step. The reasoning behind developing job specific training is twofold. For one, these officers need to be prepared physically to decrease the likelihood of injury and to increase their longevity on the force. Secondly, job specific training will better prepare them for the variety of tasks they may be called on to perform.

An additional benefit of initiating training is to reduce the risks of coronary heart disease (CHD). Research has shown that law enforcement, with the long, irregular hours and graveyard shifts coupled with little activity and poor nutritional habits is conducive to a stressful work environment which in turn puts these men at risk for developing CHD (Hoffman& Collingwood, 1995). Among the risk factors associated with CHD is high blood pressure, high cholesterol (particularly elevated LDL levels, and decreased HDL levels), increased blood glucose levels, smoking, excessive body fat, inactivity, emotional stress, and family history. A training program will increase activity thus addressing several of the modifiable risk factors associated with CHD. Increasing activity, specifically aerobic type activity, directly affects one of the modifiable risk factors and indirectly affects other

modifiable risk factors such as decreasing body fat and lowering blood pressure and cholesterol (McArdle, Katch, & Katch, 1994). Additionally, weight training has been shown to have a positive effect on psychological state (Norvell & Belles, 1993), suggesting yet another risk factor positively affected by activity

Although there are numerous publications advocating the need for law enforcement personnel to be physically fit, the majority of these ideas also apply to the general populatio I believe, however, that the SRT is a unique population due to their job expectations. A limited amount of research is available regarding special teams and job specific training that is designed to meet individual needs. The only way to effectively prepare these officers for duty is by finding out specifically what those duties are. Defining the duties of the SRT is a precursor for development of job specific physical fitness testing in the future.

As I proceed I will cite examples of studies conducted showing the poor level of fitness among law enforcement personnel. Studies such as these give a basis for the need of increasing the fitness standards of deputies. I will also look at other special teams in botl rural and suburban areas to compare their duties to the job descriptions of the officers here. Training programs will be scrutinized for job specificity. Using feedback from perceived job descriptions combined with a review of current programs in effect, I will develop a job specific training regimen. The implementation of job specific training will lay the groundwor for the development of job specific physical fitness testing.

Review of Related Literature

Limited literature is available pertaining to job specific fitness programs geared toward special units such as the SRT. There is, however, an abundance of literature recognizing the need for officers in the line of duty to be physically fit. An initial study in the area of officer fitness was conducted in 1977 for the International Association of Chiefs of Police (IACP). This study looked at cardiorespiratory endurance, percent body fat, abdominal and upper body strength, and flexibility of 203 officers. The results of the study showed that officers were less fit than the average population. For instance, officers fell into the 25th percentile on cardiorespiratory endurance and body fat, meaning that 75% of the population had greater cardiorespiratory endurance and had a lower percentage of body fat. Officers were in the 20-35th percentile in abdominal and upper body strength, and in the 45th percentile in flexibility (Hoffman and Collingwood, 1995).

The Cooper Institute for Aerobics Research has studied fitness levels of law enforcement. They studied law enforcement fitness levels from 1983 to 1992. The results of the Cooper Institute study showed slight improvement of fitness levels from prior studies. Percentiles were increased between 5-15%, showing the greatest increase in upper body strength (from the 20-35th percentile to the 50th percentile). In 1992 The Penn State Aging Study looked at the fitness levels of 5,000 to 10,000 officers from six areas. This research showed similar results, concluding that body fat percentages were higher than the general population and aerobic endurance was again below average compared to the general population. This study did, however, show the sampled officers to be above average in strength and low back flexibility. All of the studies showed that special units, such as SWAT

teams, had higher fitness levels. They also showed officers over 35 years old had the poorest physical abilities (Hoffman & Collingwood, 1995).

Organizations such as the International Association for Chiefs of Police (IACP) and the Commission on Accreditation for Law Enforcement Agencies (CALEA), have acknowledged the poor health and fitness levels of officers and have suggested plans to address the issue of officer fitness. Independent agencies are also becoming increasingly aware of the need for standardized training programs and fitness levels. Studies showing the rate of early retirement, as well as the rate of retirement due to medical problems, suggest that routine training and testing of officers may help reduce the rate of premature retirement. Studies show that officers are more prone to developing diabetes, cardiovascular disease, and colon cancer causing earlier deaths among officers compared to the average population. Studies show that 20% of officers don't reach their scheduled retirement and 14% are forced to take early retirement due to medical problems. Increasing officer fitness levels can theoretically increase overall health status, such as reducing the rate of cardiovascular disease and increasing the age of retirement (Hoffman & Collingwood, 1995).

Meeting physical performance standards is typically a prerequisite for participating on special units. What varies between agencies is the type and frequency of performance testing. For instance, the Napa, California Police Department's SWAT team has to pass fitness testing that includes a two-mile run, sit-ups, push-ups, and pull-ups. This group trains together monthly and is tested on a quarterly basis. As a comparison the Los Angeles Polic Department requires all cadets to pass a Physical Abilities Test which includes tests designed to measure balance, strength, agility, and endurance. These two agencies are just an example of the diversity of performance testing and screening procedures in practice.

Methodology

The Missoula SRT was formed in 1979 and is currently made up of eight men. They meet on a monthly basis for tactical training and are fitness tested quarterly. The SRT is expected to maintain fitness standards 20% higher than non-SRT officers. SRT members are required to pass physical fitness testing components in the 60th percentile while non-SRT deputies are only required to pass in the 40th percentile.

Recognizing the Process

Although an involved process is recognized in implementing any new or unique concept, only the beginning stages of an entire process will be followed through at this time. The process identified with begins with research of the new or unique idea and progresses through development, evaluation, and implementation of this same idea (Isaac & Michael, 1982). As the preliminary step in any process is a review of related research, likewise this process is initiated with a review of training programs already in practice and research supporting the need for the implementation of a job specific training program. Reviewing the related research provides the rationale for further development of a training program geared toward a specialized tactical team. As mentioned the progression of an entire process is recognized, however for the purpose at hand the process will conclude at this point. The normal progression is to continue by evaluating the effectiveness of the training program that is designed and modify it if necessary. Ideally evaluation of the training program in regard to it's job specificity, adherence, and necessity will follow in the future.

Determination of Job Tasks

The physical demands of SRT groups will be determined by; 1) reviewing the Missoula SRT written job descriptions, 2) reviewing job descriptions of other similar geographic area tactical teams, and 3) conducting individual interviews with the members of the Missoula SRT, if necessary. By looking at a variety of rural tactical teams as well as a variety of suburban tactical teams, a job description will be proposed for the officers to compare to their own perceived job description. Based on the perceived accuracy of the job description it may be necessary to get further input from the officers via one on one interviews. By forming a framework of what is within their job duties I will be able to implement specific tasks to more effectively prepare them for the duties expected of them on the job. A job-specific training program will be developed that members of the team will be expected to include in their fitness regimen. The program will also include variations that can be done for different components of the program. For instance, if aerobic endurance is found to be a necessary component of the team's training regimen, then the officers will be able to choose among several alternatives that qualify for aerobic training. If it is climbing stairs, however, that is a large part of their job demands then the group will be asked to train specifically for this purpose, by running stairs. The training program will be presented to the SRT as a group and education of the physical components included in the program will be covered. The officer's level of knowledge of the components of the fitness regimen will determine the amount of time that will need to be spent on instruction of the program. For those that need additional assistance, individual, one-on-one appointments will be scheduled. Following instruction, the officers will be asked to record their workouts and submit them on a weekly basis, at which time they may be modified to meet individual needs.

Implementation

All eight of the officers of the SRT will be expected to participate in the training program. The goal is to motivate the officers to set themselves apart, physically, from other officers. Tactical teams are considered to be an elite group and they need to be reminded an elite status is based not only on their tactical skills but also their physical status. In addition to independent training, the team will be encouraged to incorporate physical training into their monthly meetings.

At this time no pre and post testing will be taking place. The primary goal at this time is to establish a need for physical training among the SRT and to educate, as well as motivate, the officers on the team to include this component in their training sessions. A review of related literature pertaining to officer fitness supports the need for increasing fitness levels among officers (Hoffman & Collingwood, 1995). Taken a step further, I will suggest that fitness needs to be improved and/or achieved through activities that are specific to the tasks being performed on the job. Testing measures would be better suited after successful implementation of a training program and inclusion in regularly scheduled meetings. The training regimen will be based on job tasks and testing measures can be developed later using the same information.

One limitation of implementation of this type of program is that there is no monetary incentive to get the men more active. Educating the group on why it is important for them, both on the job and off, to increase their fitness levels will be the approach taken. The importance of maintaining a physically active lifestyle is of even greater importance for this population than among the general population and this fact will be stressed through education. Not only does this group have a greater likelihood of coronary heart disease and job-related

injuries but an additional concern is the fact that other people, the public as well as their partners, rely on this group for their safety and well-being. At the present no funding goes towards physical training for the Missoula SRT. Making the SRT a more physically fit group may, in the future provide a basis for departmental funds possibly in the form of facilities, incentives, or knowledgeable, trained staff to work with the training of this specialized tactical team.

Results

Obtaining Job Descriptions

A variety of sheriff's departments throughout the state were contacted to obtain written job descriptions for their tactical team. The tactical teams of Billings, Great Falls, Helena, and Bozeman were contacted. These cities were chosen because they were expected to; 1) have a tactical team and 2) be similar to the Missoula team in the type and frequency of call-outs. Each of these cities does in fact have a tactical team. The teams are similar in size to Missoula's team, ranging between eight and 12 members participating on a voluntary basis. The difference, however, was none of the teams contacted currently have written job descriptions. Many of the teams are currently going through restructuring, which includes formulating policies and procedures specific to the tactical team.

In addition to contacting Montana departments, a variety of agencies throughout the United States were contacted via the Internet and by telephone to get an idea of what other departments have as far as job descriptions. No specific criteria such as geographic location or team size was preferred when contacting agencies, instead a diversity of agencies were contacted. The departments contacted included the Napa, California Special Weapons and Tactics Team (SWAT), the Placer County, California SWAT team, the Charleston County, South Carolina SWAT team, the Jefferson County SWAT team of Birmingham, Alabama, and the Metro Nashville SWAT team of Nashville, Tennessee. An indication of the organization and response of the team was attained by contacting different groups throughout the United States. The idea, regardless of the geographic uniqueness and the many other differences of various departments, was to find areas with established job descriptions for their tactical teams. Among the eight departments contacted, from California to South Carolina, not a

single one responded. Many of the departments were contacted two to three times with still no response. Again the lack of response from the departments was, in itself, instrumental in getting an idea of the organization of the teams.

Self-Perceived Physical Components of Tactical Duties

To directly address the Missoula SRT, a questionnaire (Appendix) was given to each of the officers on the team. The questions were designed to find out how the officers believe fitness affects them in their tactical team job duties. Responses to the questionnaires proved helpful to establish what the officers perceive as the important physical components necessary to perform more safely or effectively on the job. Six of the eight questionnaires were returned. The answers to the questions are covered in the same order as listed on the questionnaire. The responses regarding the most physically demanding aspect of tactical team duties had several overlaps among respondents. The most physically demanding task noted by several of the men is running and scouting locations with all the gear on. Crawling, climbing, and jumping with the added weight of gear was listed second as the most physically demanding activities. Working long shifts in excess of 12 hours was also noted to be physically demanding, as were the awkward positions that have to be maintained for long periods of time during surveillance and then the sudden bursts of energy needed to respond to a situation.

The responses to the physical aspects involved in barricade and hostage situations was endurance, flexibility, agility, strength, and the ability to stay alert and focused while remaining calm during wait times. During long sieges, physical and mental endurance is necessary, while flexibility is perceived important in order to stay limber during long periods of waiting prior to

quick, unexpected activity. Agility was found important to aid in quick and efficient movement in tight areas.

Speed and agility are seen by the men as an important component in handling high risk warrants. Speed and agility was described as being able to move quickly and smoothly through obstacles or through restricted areas. Adding to this, one team member reported that precise, coordinated movement is necessary when having to act quickly. Strength and cardiovascular conditioning were also mentioned frequently due to the need to break down doors or obstacles, subdue suspects, and pursue suspects.

With protective service details strength, endurance, flexibility, and speed were deemed important. Endurance was noted important in order to maintain mental and physical alertness. Flexibility is required to react quickly to situations. A physically fit appearance was noted in this category to instill self-confidence and to intimidate attackers and possibly prevent an attack from occurring.

Crowd control situations were said to require upper and lower body strength and speed. Strength is important to handle crowd situations that require force. Combating physical attacks and self defense also requires strength.

None of the team members believed there was a physical component involved in special event management/planning. Special event planning is mentioned as one aspect of tactical team duties in their written job description, however this component, according to the officers, involves more of an organizational aspect versus actual physical type work. One respondent said this may include conducting surveys, which itself requires nothing physically, however he did proceed to mention that their appearance and their image of looking fit may have an affect on their credibility when representing their department's specialized team.

Special law enforcement training reportedly requires strength, endurance, and flexibility. The answers to this question reflected the overall physical components necessary for tactical team work. The question was taken directly from the team's written job description and as written on the job description it is implied that this training is for the benefit of non-team members, conducted by team members. As the question read however, the responses related the question to what physical components they required on their job as team members. In other words, the responses to this question are redundant because the answers are repeated in other questions, which asks what physical attributes are believed to be necessary to perform their jobs. Strength, endurance, flexibility, and the ability to perform a variety of different tasks was mentioned as important components, again pertaining specifically to their work as team members.

Upper body strength was unanimously agreed on as a necessary component of tactical team work. The reasoning given was to be able to maneuver the body with the additional weight of gear. Having upper body strength was also believed to prevent injury, provide the ability to knock down barricades, and handle suspects that may result in a physical struggle.

Lower body strength was again unanimously deemed necessary for this type of work. The reason being was having to carry the added weight of gear. Also lower body strength was reportedly related to endurance and the ability to sprint.

The response to what types of sustained activities, if any, are engaged in on duty was varied. Some said running and hiking were necessary when either pursuing a suspect or getting into position in remote areas. Others claimed no aerobic-type activity (i.e., running) was sustained over a long period of time. The common denominator in this category,

however, was that the men would be wearing their heavy gear and possibly be trekking through mountainous areas, most likely in adverse weather conditions.

Only one person said he did not believe flexibility was an important component to aid him in performing his job. The rest of the group did think flexibility was an important aspect of their job. Most recognized the relationship between flexibility and a decreased chance of injury.

Each member of the team believed it is important individually and for their team members to be physically fit. Benefits for the team included self-confidence and the fact that as one person recognized, "you're only as good as the weakest link." The officers tended to agree that less fit individuals could jeopardize, not only their own safety, but also the safety of the whole team.

Most Frequently Identified Strengths

By far the most frequent answers to questions involved the need for strength and flexibility. Most every area of tactical team work reportedly requires some form of strength for carrying gear. Upper body strength was also particularly important for self protection. Flexibility was noted in many categories as being important for short, intense bursts of energy. Endurance was the other component that was mentioned several times and not solely how endurance related to the physical aspect of the job, but mental endurance was mentioned repeatedly in regards to having the stamina to maintain the long, unpredictable job duties. One of the officers compared the tactical team duties to a football game in that the "player" needs fast bursts of speed, flexibility, strength, and endurance. He continued to relate that tactical "games" last anywhere from 4 hours to eight days and may include 12 plus hour shifts.

Discussion

Based on the available research pertaining to the fitness levels of law enforcement personnel, officers typically fall below the general population in their physical fitness status. Not only does this decreased ability affect the health of the officers themselves, but they, unlike the general population, do have a direct effect on the welfare of others. These are the men and women who we as the public are relying on to protect us. The fact that this group is less than fit is discomforting at least, and at best can be harmful. The rationale for not only developing, but maintaining, fitness through the years on the force has been established in the literature for law enforcement. The subgroups of law enforcement, such as specialized tactical teams, are no exception. Tactical teams, in fact, have an even greater need for fitness. Due to the nature of tactical team work, of long hours and unpredictable call-outs, the members of tactical teams have to be physically prepared for anything they may encounter. Tactical teams ideally should represent an elite group in their tactical skills, as well as their physical abilities.

Physical fitness testing has been developed to address the issue of decreasing fitness among law enforcement. However, is quarterly testing, as is the case with the Missoula SRT, adequate to maintain the supposed elite status of the team members? Granted the team is required to pass the tests in the 60^{th} percentile compared to the 40^{th} percentile requirements of non-SRT members, is this enough? Secondly, is the testing, the mile and a half run, push-ups, sit-ups, and a sit and reach test adequate measures of fitness levels for SRT members? In other words, do these tests determine the members of the team are physically fit and can safely and effectively perform their jobs? The answer is probably yes if they are required to do push-

ups and sit-ups on the job, but more than likely they won't be doing these things, but more likely running, jumping, and crawling. If this is the case, tests that measure their ability to do these tasks would be more indicative of job performance. Training would be more effective if it was designed to include activities done on the job. Job-specific testing would then evolve from the job-specific training programs.

Motivational Aspects

The Missoula SRT is a volunteer group that trains together to handle high risk situations. Other than the physical fitness standards the team is required to meet on a quarterly basis, there are basically no other incentives for the team to excel physically. The biggest motive, however, was found to be self-confidence and having the self-responsibility to maintain the standards of the team. As mentioned previously, the team is only as good as its weakest link, and with this in mind the officers tend to compete against one another physically. The idea of implementing a fitness regimen, however, is to design tasks that are more related to job duties and take the group to a higher level, from one that meets fitness standards to one that far exceeds standards. Again, being a tactical team, the group should represent an even higher level of fitness.

Responses to Questionnaires

The response from the Montana based agencies contacted was favorable but was of little help. The departments were more than willing to help, but none of the teams had any useful information. In fact, many of the teams were modeled after Missoula's SRT.

The out-of-Montana departments contacted were also of little help. Interestingly, the response was favorable over the phone, however, no departments produced useful

information. The teams contacted were very diverse in their numbers and geographic locations.

Based on the results of the questionnaires returned by the officers on the team, they all agree that physical fitness is an important aspect of their job. Of the four components of fitness (muscular strength, muscular endurance, aerobic endurance, and flexibility) all appear to be important components for tactical team work. Upper and lower body strength and flexibility were the most mentioned aspects, followed by aerobic endurance. From the results of the questionnaires, training can be developed that incorporates these aspects. Ideally training will include mimicking the tasks expected to be performed on the job. The challenge with this, however, is the diversity of duties. The goal, regardless is to get these officers in optimal physical shape so they will be able to perform safely and effectively in a multitude of situations.

Considerations of Fitness Tests

As emphasized the primary goal of a training program for the members of the Missoula SRT is to incorporate job specific tasks. Consequently the current concern has to do with the testing measures presently being utilized to assess the varying components of fitness. The tests being utilized by the Missoula team include a mile and a half run, push-ups, sit-ups, and a sit and reach test which measure aerobic endurance, two tests of muscular endurance, and flexibility, respectively.

The four fitness tests included in the SRT fitness test battery are an example of a multitude of tests designed to measure different components of fitness. Several concerns, however, are associated with fitness testing, particularly when used to determine eligibility requirements for employment, such as among this group. Additional concerns include the

reliability and validity of the tests used and how the reliability and validity of the tests are indicative of job tasks. A test that is valid is one that measures what it is designed to measure. For instance, is the sit and reach test, which is designed to measure hamstring and low back flexibility, actually a correct measure of these two components? Validity is supported by evidence proving that the test does in fact measure what it is designed to measure. Reliability, on the other hand, is concerned with the repeatability of the test. A test is said to be reliable if it can be repeatedly administered with the same, or similar, results. That is if the sit and reach test is administered consecutive times similar results will be obtained.

The sit and reach test is a test designed to measure hamstring and low back flexibility. Flexibility is defined as the maximum ability of a muscle to stretch, or lengthen, through a range of motion (American College of Sports Medicine, 1991). Flexibility is an important component of fitness, with hamstring and low back flexibility being particularly important for maintaining back health. At some time during the lifetime, 60-80% of the population is afflicted with low back pain (Cailliet, 1988). A greater degree of hamstring and low back flexibility is related to a decrease in low back pain, and conversely decreased flexibility is related to low back pain. Inflexibility in the low back puts undue stress on the hamstring musculature, causing pain and making flexion and lateral movements uncomfortable. With hamstring inflexibility pelvic rotation is compromised causing excess stress on the spine and consequent low back pain (Cailliet, 1988). Due to the relationship between flexibility and back pain, the inclusion of low back and hamstring flexibility measurement is a logical component of fitness testing.

The sit and reach test is easy to administer with the only supplies necessary a box and a yardstick. The subject sits with knees fully extended and feet against the box. They are

instructed to reach as far forward as possible, sliding the index fingers of both hands down the yardstick. A measurement is recorded when the furthest position reached can be maintained for several seconds.

The validity of the sit and reach test for the measurement of low back and hamstring flexibility has been questioned. Several studies have looked at the validity of the sit and reach test for measuring both hamstring and low back flexibility. The accuracy of the sit and reach test is questioned because it is unlikely that one test can correctly predict flexibility of more than one muscle group. Criterion validity testing has shown the standard sit and reach test to be moderately valid in measuring hamstring flexibility, with little validity for measuring low back flexibility (Jackson & Baker, 1986; Jackson & Langford, 1989). Other sit and reach tests have been developed to address some of the issues associated with the standard sit and reach test such as the low validity measures obtained from the sit and reach test in criterion-related validity testing(Jackson & Baker, 1986; Jackson & Langford, 1989), the affect of limb length (Hoeger, et al., 1990), and the possible compressive forces put on the vertebrae with the sit and reach testing procedure (Cailliet, 1988). The sit and reach test and modified sit and reach tests have shown to more accurately predict hamstring flexibility than low back flexibility as the test suggests.

Although the validity of the sit and reach test is questionable, the reliability appears to be high (Patterson, 1996). The good reliability of the sit and reach test allows the test administrator to conclude the degree of flexibility without having to repeatedly test. It is cautioned, however that the sit and reach test be used with discretion as a predictor of hamstring flexibility and, based on the findings of studies to date, not low back flexibility.

An additional concept to consider when using the sit and reach test is the positioning of the pelvis during the test. Sullivan et al. (1992) looked at the relationship between an anterior pelvic tilt compared to a posterior pelvic tilt in gaining hamstring flexibility. The study compared different stretching techniques with both anterior and posterior pelvic tilting. The results of the study showed that an anterior pelvic tilt was more important in gaining hamstring flexibility than was the type of stretch used (Sullivan, 1992). The importance of this finding in regards to the sit and reach test is the posterior positioning of the pelvis during the sit and reach test. It can be surmised that if greater hamstring flexibility can be achieved with an anterior pelvic tilt than with a posterior pelvic tilt, hamstring flexibility measured in the sit and reach fashion, with posterior pelvic tilt, may not be the most accurate test for measuring hamstring flexibility. The limitations of the sit and reach test must be kept in mind when administering the test.

Muscular endurance is the ability of a muscle group to maintain repeated contractions over an extended period of time (American College of Sports Medicine, 1991). Muscular endurance is necessary to sustain an activity for a prolonged period of time without excessive fatigue. The sit-up test and the push-up test used as part of the SRT physical fitness tests are two tests designed to measure muscular endurance of the upper body. The sit-up test requires the subject to complete as many sit-ups as possible in 60 seconds. The push-up test is not timed but requires the subject to do as many push-ups as possible without rest. The sit-up test is designed to measure the endurance of the abdominal muscles, while the push-up test is designed to measure upper body endurance. Both tests are classified as dynamic muscular endurance tests because they involve the same movement being performed repeatedly (American College of Sports Medicine, 1993).

Abdominal weakness is related to increased low back pain, which provides rationale for testing the abdominal musculature. However, the sit-up test has been criticized as a tool for measuring abdominal endurance because the hip flexor muscles hugely contribute to the motion of trunk flexion. In other words, the sit-up test is used to measure abdominal endurance but it does not take into account the percentage of that motion that is provided by the hip flexors. Beyond 30° of trunk flexion the hip flexors take over with concentric contractions, while the abdominal muscles contract eccentrically. Also full sit-ups can put undue strain on the spine and the associated musculature. Because the sit-up test does not isolate the abdominal musculature and test specifically these muscles, as it is proposed to do, the sit-up test's validity is jeopardized. The reliability, however, of the sit-up test is high. Repeated tests provide similar results time after time, assuming there is adequate rest periods between trials. The push-up test is designed to measure upper body endurance. Studies have shown the push-up test to be a reliable test. The validity, however is compromised by the fact that strictly recording the number of push-ups completed does not take into consideration body weight (American College of Sports Medicine, 1993). Body weight and strength greatly affect the outcome of testing. Due to the contribution of upper body strength and body weight, testing in relative terms would be a better predictor of individual muscular endurance. Additional concerns related to endurance testing relates to specificity. For example, the sit-up test and the push-up test can not be generalized to other muscle groups, they merely predict the endurance of the abdominal muscles and the upper body musculature, respectively (Heyward, 1984).

The mile and a half run test is one of many running tests developed to estimate cardiorespiratory endurance, or aerobic capacity. Cardiorespiratory endurance is the ability to

sustain moderate to high intensity activity involving large muscle groups over an extended period of time (American College of Sports Medicine, 1991). Cardiorespiratory endurance, as achieved via regular aerobic activity, is an important component of fitness making it a desired component of fitness testing. Decreased physical activity is associated with coronary heart disease (CHD), therefore activity addresses one of the modifiable risk factors associated with CHD, as well as providing many other health benefits. Because measuring VO_2 max is not a practical testing method due to the equipment, time, and expertise necessary to test subjects, submaximal field tests have been developed to more easily administer tests to estimate VO_2. The validity of field tests is determined by the correlation between run times and actual VO_2 max. Typically the longer run tests have had a higher correlation with VO_2 max (Heyward, 1984). The reliability of the mile and a half run is high due to the ease of administration. Assuming adequate recovery time has preceded, the results of testing are highly reproducible.

Recommendations

The four fitness tests mentioned all have their limitations within the general population. A whole other issue arises when tests designed to assess fitness among the general population are used for the purpose of employment screening and employment fitness testing. Prior to any tests being adopted for employment purposes, it is necessary to determine what physical components the job requires, if in fact it does have a physical component. Regardless of the validity of these tests for a general population, they are probably not very indicative of what deputies are doing in the field. One of the key concepts with training, and hence testing is specificity. Specificity in terms of training means that training must be specific to the activity being prepared for. A greater emphasis needs to be put on specificity of training for the members of the SRT and from there designing tests based

on the tasks they are required to do in the field. For example, the push-up test would be indicated if one of the job duties of the SRT was to lay on the floor and do push-ups. Because this is highly unlikely, a better test would be one that is specific to the job performed. For instance, if the job requires running around and through obstacles, then a possible test would include just that. Running a mile and a half in a given period of time is less indicative of how well a task will be done than actually doing the task.

Fitness testing the members of the Special Response Team is an appropriate way to screen potential candidates, however testing, at least the current tests in use, should be used with discretion and not used as a primary screening tool because they are not necessarily indicative of job performance. The purpose of testing is twofold. One is to determine whether the officers are capable of performing their job duties and secondly to give them incentive to maintain their fitness levels, for the same purpose, to more safely and effectively perform job-related tasks. Testing shouldn't be done away with entirely, however there appears a need for tests that more accurately assess the ability to perform job duties. The components of fitness (aerobic endurance, muscular strength and endurance, and flexibility) have there place, and yes, the SRT needs to be physically fit, but this group has additional physical considerations that need to be addressed by job-specific training and consequently job-specific testing. Again, the goal of job-specific training and testing is to prepare officers to perform their duties in a safer, more effective manner.

References

American College of Sports Medicine. (1993). *ACSM's resource manual for guidelines for exercise testing and prescription* (2nd ed.). Pennsylvania: Lea & Febiger.

American College of Sports Medicine. (1991). *Guidelines for exercise testing and prescription* (4th ed.). Pennsylvania: Lea & Febiger.

Brooks, G. A., & Fahey, T. D. *Exercise Physiology: Human Bioenergetics and Its Applications.* New York, NY: Macmillan Publishing Co., 1985.

Cailliet, R. (1988). *Low back pain syndrome* (4th ed.). Philadelphia: F. A. Davis Company.

Carmona, R. & Rasumoff, D. (1994). Inside the perimeter: Diet and performance in the tactical environment. *The Tactical Edge*, Summer, 82-83.

Grossi, D. (1995). Physical fitness: Part 1, the missing point. *Police Marksman*, March/April, 22-25.

Grossi, D. & Konrad, J. (1995). Physical fitness: Part 2, conditioning and nutrition. *Police Marksman*, May/June, 25-28.

Grossi, D. & Konrad, J. (1995). Physical fitness: Part 3, chief, are you liable? *Police Marksman*, July/August, 18-21.

Hayward, V. H. (1984). *Designs for fitness: A guide to physical fitness appraisal and exercise prescription.* Minnesota: Burgess Publishing Company.

Hoeger, W. W. K., Hopkins, D. R., Button, S., & Palmer, T. A. (1992). Comparing the sit and reach with the modified sit and reach in measuring flexibility in adolescents. *Pediatric Exercise Science*, 2 156-162.

Hoffman, R., & Collingwood, T. R. *Fit for Duty*. Champaign, IL: Human Kinetics Publishers, Inc., 1995.

Hoffman, R., & Collingwood, T. R. (1996). Fit for duty: The nature of police work can contribute to lack of fitness. *Law and Order*, July, 17-18.

Isaac, S. & Michael, W. B. *Handbook in Research and Evaluation* (2nd ed.). San Diego, CA: Edits Publishers, 1982.

Jackson, A. W., & Baker, A. A. (1986). The relationship of the sit-and-reach test to criterion measures of hamstring and back flexibility in young females. *Research Quarterly for Exercise and Sport*, 57, 183-186.

Jackson A. W., & Langford, N. J. (1989). The criterion-related validity of the sit and reach test: Replication and extension of previous finding. *Research Quarterly for Exercise and Sport*, 60, 384-387.

Maud, P. J., Foster, C. (1995). *Physiological assessment of Human Fitness*. Illinois: Human Kinetics.

McArdle, W. D., Katch, F. I., & Katch, V. L. *Essentials of Exercise Physiology*. Malvern, PA: Lea & Febiger, 1994.

Norvell, N. & Belles, D. (1993). Psychological and physical benefits of circuit weight training in law enforcement personnel. *Journal of Consulting and Clinical Psychology*, 61(3), 520-527.

Patterson, P., Wiksten, D. L., Ray, L., Flanders, C., Sanphy, D. (1996). The validity and reliability of back saver sit-and-reach test in middle school girls and boys. *Research Quarterly for Exercise and Sport*, 67, 448-451.

Rachlin, H. (1996). Officers and heart disease. *Law and Order*, July, 70-77.

Sanders, N. R. (1992). Concepts for physical fitness: The SWAT officer as athlete. *The Tactical Edge*, Spring, 24-26.

Sullivan, M. K., Dejulia, J. J., Worrell, T. W. (1992). Effect of pelvic position and stretching method on hamstring muscle flexibility. *Medicine and Science in Sports and Exercise*, 24:1383-1389, 1992.

Suni, J. H., Oja, P., Laukkanen, R. T., Miilunpalo, S. I., Passanen, M. E., Vuori, I. M., Vartiainen, T., Bos, K. (1996). Health-related fitness test battery for adults: Aspects of reliability. *Archives of Physical Medicine and Rehabilitation*, 77:399-405, 1996.

Table 1

MINIMAL REQUIREMENTS FOR PHYSICAL FITNESS PERFORMANCE FOR MALES

Age	20-29	30-39	40-49	50-59
Sit-ups	42	39	34	28
Push-ups	37	30	24	19
1 ½ mile run	11:41	12:20	13:14	14:24
Sit and reach	18.5	17.5	16.3	15.5

MINIMAL REQUIREMENTS FOR PHYSICAL FITNESS PERFORMANCE FOR FEMALES

Age	20-29	30-39	40-49	50-59
Sit-ups	38	29	24	20
Push-ups	30	24	18	17
1 ½ mile run	14:24	15:08	15:57	16:58
Sit and reach	20.5	20.0	19.0	18.5

Appendix

Your name does not have to accompany the following questionnaire. Information obtained from the questionnaire will be shared with the group, with no names or identifying features being attached to the answers.

1. In your opinion what is the most physical activity you have to do as a tactical team member?

2. In barricade or hostage situations do you rely on any physical components (i.e. strength, endurance, flexibility)? If so, explain what and why?

3. In high risk warrant service do you rely on any physical components? If so, explain what and why?

4. With protective service details do you rely on any physical components? If so, explain what and why?

5. Working crowd control situations do you rely on any physical components? If so, explain what and why?

6. With special event management/planning do you rely on any physical components? If so, explain what and why?

7. When you are involved in special training for law enforcement do you rely on any physical components? If so, explain what and why?

8. Do you feel that having upper body strength is necessary to perform your job either more effectively or more safely? Explain.

9. Do you feel that having lower body strength is necessary to perform your job either more effectively or more safely? Explain.

10. Do your tactical team duties require you to be able to run or do sustained activity for a prolonged period of time? If so, what types of activities do you do for a lengthened period of time and in what situations do you do them?

11. Do you feel having a degree of flexibility throughout your body is necessary to perform your job either more effectively or more safely? Explain.

12. Do you feel it is important for you and your fellow team members to be physically fit? If so, explain why?

13. Are there any other job related tasks you feel require a physical component? If so, what activities are they, explain.